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MOUNTAINEERING IN BRITISH COLUMBIA.

BY

ERNEST INGERSOLL.

The Rocky mountains have become rapidly known of late, yet not a little misapprehension seems to remain in regard to them. The term is the name of a system—not a single chain; or rather, it is both, for while the whole system is called “the Rocky mountains,” the irregular parts of the line of greater elevations which together form the continental watershed, are often termed the Rockies in distinction from neighboring ranges and spurs.

Every one knows the position of this system as the first uplift westward of the great plains, and that beyond it lie the arid basins of Utah and Idaho, and the interior plateaus of British Columbia.

The Rockies may be said to begin in northern New Mexico, and they almost at once attain their greatest elevation, for the loftiest peaks of the whole system belong to southern Colorado. The word “range” does not express the form of these mountains, generally speaking, at all. The Rockies cover a whole country, populous with mountains. “It is as if an ocean of molten granite had been caught in instant petrification when its billows were rolling heaven-high.”

Nevertheless, popular language divides the system into certain great lines. Thus a “Main” or “Snowy” range is recognized in Colorado, meaning the continental watershed there, but this so breaks up and ramifies in the

central part of the state, that it is only by seeking the headwaters of the separated streams, that one can trace this spiny backbone of the continent. Eastward of it stand the splendid lines of the Sangre-de-Cristo and Front ranges, upholding loftier peaks than those of the main chain itself. Westward a wide area is filled with vast uplifts, standing in isolated groups, serving as cross-links, or lying parallel with the general north-and-south lines of great elevation.

Such are the Rocky mountains in Colorado. Along the northern line of that state and Utah they break down, and the sage desert reaches far eastward to meet the plains on the plateau of South Pass. Here is a broad depression, through which conveniently passes the Union Pacific railway; and to cross the country by this route, in the hope of enjoying a view of the Rockies, will lead to disappointment, since an unsatisfactory glimpse of a few far-away peaks, behind some dreary foothills, is all that is possible to the traveller. If a tourist wants a fair sight of the Rockies from a railway train, he must choose some other route than that of the Union Pacific!

North of South Pass the system is resumed in a single chain stretching northward to the Yellowstone National Park. The park is at a centre of elevation. Groups of lofty and broken heights radiate in every direction, out of which chaos two great ranks, the Main Range and the Bitter Root mountains, extend northwestward beyond the United States, rising resplendent in British Columbia in the three noble mountain ranges, hitherto almost unknown, which it will be my pleasure to describe to you to-night.

The vast system we have traced has been steadily trending westward. Pike's Peak, in Colorado, is on the 105th meridian; the Yellowstone Park is near the 110th; while the eastern foot of the Rockies at Calgary, is on the 117th. In other words, the main "Divide" sweeps northwestward from the longitude of Denver in southern Colorado to that of Salt Lake City, at the Canadian boundary,—a westing of five or six hundred miles; and this continues until the whole system sinks out of sight on the coast of Alaska.

It had been my fortune to explore every part of this system within the United States; and when, during the summer of 1885, opportunity was offered me to traverse the less known Rockies of British America I gladly availed myself of it. What sights awaited me I could get little idea of, for of the very few persons who had been there none retained coolness enough to do more than exclaim at the stunning majesty and the bewildering beauty which had overcome their senses.

The month was August. My route was from Toronto up the lakes to Thunder Bay, thence by rail to Winnipeg, and so on across the glorious Canadian plains to the foot of the mountains at Calgary—a town about one hundred and fifty miles north of the boundary.

When one has travelled day after day across these seemingly endless opens, he searches the horizon eagerly for the first glimpse of the mountains. "I strained my eyes," writes Fitz Hugh Ludlow, that brilliant genius whose eyes were too soon closed in the grave, "in the direction of the driver's pointing finger, but for a minute could see nothing. Presently sight became adjusted to a new

focus, and out against a bright sky dawned slowly the undefined shimmering trace of something a little bluer. Still it seemed nothing tangible. It might have passed for a vapor effect of the horizon, had not the driver called it otherwise. Another minute and it took slightly more certain shape. It cannot be described by any eastern analogy; no other far mountain view that I ever saw is at all like it. . . . It is impossible to imagine them built of earth, rock, any thing terrestrial; to fancy them cloven by horrible chasms, or shaggy with giant woods. They are made out of the air and the sunshine which show them. Nature has dipped her pencil in the faintest solution of ultra-marine, and drawn it once across the western sky with a hand tender as Love's. Then when sight becomes still better adjusted, you find the most delicate division taking place in this pale blot of beauty, near its upper edge. It is rimmed with a mere thread of opaline and crystalline light. For a moment it sways before you and is confused. But your eagerness grows steadier, you see plainer, and know that you are looking on the everlasting snow, the ice that never melts."

My first sight of these Canadian Rockies was caught at a station called Gleichen, quite one hundred miles away from the lace-like touches of white, just at the horizon, which denoted their topmost pinnacles; and after that we became all attention to see them grow distinct and real, and to watch their majestic outlines slowly emerge from the cobalt-blue silhouette into which distance turns the whole range.

The profile of the easternmost or front range, seen from Calgary, is extremely irregular. There is no stately line of rounded summits set in orderly array, nor an evenly

serrated chain of peaks ; but the sky rests upon a jagged wall, every elevation having some angular and abrupt form quite unlike its neighbor, and the whole seeming a long stretch of ruins, rather than a mountain range which apparently has been less harmed by the "tooth of time" than any other in the West. As we ascend the turbulent Bow river, passing through its narrow portals into a long lateral valley, we begin to understand this jaggedness of profile. These are not granite ridges such as rise with easy sloping into the massive domes about Pike's or Fremont's peaks, nor the cones characterizing volcanic areas like the Sierra San Juan. They are tremendous uplifts of stratified rocks, as old as the Devonian and Coal ages, which have been broken out of the crust of the earth and heaved aloft. Some sections, miles and miles in breadth, thousands of feet thick, have been pushed straight up, so that their strata lie as level as before, their tops are plateau-like, and their sides drop nearly vertically. Others have fallen partly over, have sunken, sideways, or are broken into colossal fragments ; or, heated to plasticity, have been bent and crumpled by prodigious pressure, laterally exerted. All this chaos looks cataclysmal, and it is hard to believe it of slow production.

Now all this angular grandeur of outline is intensified by the great quantity of snow and ice borne winter and summer upon their naked and chilling heads. In winter the snows pile themselves unceasingly upon the crests and promontories, collect in the half-crushed forests that essay to climb the upper slopes, alight in clinging drifts upon every ledge and projection up and down the cliffs, and pack into the cañons until tall trees are hidden, and knoll and pit, river-bed and gravel-ridge are all as one.

But by and by an insidious stream eats its way into the base of some smooth incline of snow draping a steep front ; or too ponderous a burden is heaped by some careless cloud upon the top ; or the spring sun fires his arrows into an unguarded point ; and so the weakened under flakes let go. There is no catching again ! The whole mass begins to move downward—very slowly at first. But every inch of progress breaks some new fastening and the impetus grows. A few moments—seconds perhaps—suffice to set the whole broad, thick mass of snow sliding forward with crushing swiftiness and power. The speed increases. The snow is rolled over and over, condensed into huge spheres, tossed into clouds of crystal dust—packed together by the pressure of its resistless descent ; until with an echoing roar, reverberated from a hundred heights, the thunderous volumes crash downward to the mountain's foot, sweeping a clean path.

Thus with ever-shifting form and hue the mountains rise swiftly into glory and large suggestiveness, until, almost before we know it, we attain the foot of the great central chain, and begin the ascent of the pass itself, leaving the Bow river and turning to the left up one of its tributaries.

Now we come close underneath the snows which have been guiding us for a hundred miles. The massive heights that dominate the world around us are loaded with it, though it is late midsummer. Snow is heaped upon their backs, sprinkled upon their brows, traces in emphatic lines the stratification-ledges and every furrow upon their aged faces ! In each gorge between the headlands hangs a long white stole over the green-gray of the mountain's robe, its fringe lost among the trees ; but when such gorges are at

the very summit they often end at the brink of a cliff a couple of thousand feet high, and there the snow which half fills them must break off squarely, adding its thickness of five or six hundred feet to the height of the cliff, or, perhaps, overhanging it in a mighty cowl that some day will topple with an echoing shock into the abyss. In an alcove between Mt. Lefroy and Mt. Goodsit, nearly opposite Laggan, and again on the western side of the range, such snow-faces may be seen, one above the other like marble terraces.

The snow in the under part of these shady gorges must be what in the Swiss Alps is termed *névé*—that is, compressed by its weight into a hardness almost equal to ice. But there is no lack of real ice. The whitish-green of the Bow river, and the milky torrent we are now following, tell of the glacial origin of both these streams, and as we approach the picturesque park in which the station Laggan is situated the great mer-de-glace whence they flow, bursts into view. It is an enormous plateau of ice lifted upon the top of the range, and walled in by yellow cliffs—lonely parapets whose bases are hidden in ice, and whose crests are forever beaten by frigid blasts. This glacier is perhaps unequalled in area by any of those we shall see farther on, since it extends backward far beyond the part visible; yet it is only a remnant of the ancient glacier which once filled this whole long valley-trough, and plowed out the easy gap we are entering by. The distance to it is something like twenty-five miles, and its height about 1,500 feet above the track; but to reach it would be a most laborious and time-consuming task.

The marvellous transparency of the air here bewilders the calculations of the novice in attempting to reckon

distances or estimate altitude. The wildest guesses are made, and fruitless strength is expended in trying to walk to points which look close at hand, but are really many a mile away. Those who have had experience in the more southerly Rockies are deceived into overestimating heights, judging by the snow, through forgetting how much farther north they now are. Hoary heads, like these that confront us now, would mean thirteen or fourteen thousand feet, at the very least, in the Sierra San Juan; here they can count only ten or eleven. The magnitude of the objects looked at, again, is deceptive, for unconsciously we subject them to the familiar rules of perspective governing the smaller landscapes we are used to; and it is only by the aid of telescopes, and after much experience that we realize the distance and vast size of such features of the scene as this mer-de-glace, or an isolated freak like the Devil's Head.

Along this glacier-fed river, and through the foothills generally, lives an Indian tribe of Assiniboiné stock called Stonies, who are fine-looking fellows, good hunters, and good fighters. They came there within a generation or two, and never go out upon the plains, nor far into the mountains. The Hudson's Bay Company some years ago set up a trading station at the mouth of Kananáskas creek, which came to be called the Old Bow Fort, and was the southernmost post of the Hudson's Bay Company in the Rocky-mountain region. Traders speak highly of the good character of these Stonies, who were of considerable help to the mounted police during the Riel rebellion, going against their old enemies the Half-breeds with whole-souled fury. Except these foothill Indians, however, there is little or no humanity in the

scenery of this or the more western ranges of the Columbian Rockies. I am often asked to describe the people there, and the way men live. There are no people! The human voice was never heard in these mountains until, only three years ago, railway men and miners penetrated their fastnesses; and these adventurers dwell nowhere except at the few railway stations, upon what the cars bring to them; so there is nothing to say about people there. Nor will the time ever arrive, perhaps, when human occupation will have any injurious effect upon the savage originality of that scenery.

Though the mountains here seem tall and grand enough in all conscience, and have a sublimity not easily equalled among any even loftier ranges south, yet the whole mass of the Rocky-mountain system north of the boundary must be spoken of as depressed, since its greatest peaks do not much exceed eleven thousand feet above the sea, and none of its passes are over half that, while, on the contrary, the central ranges in the United States often reach fourteen thousand feet and upwards. Several fair passes cross the front range between the parallels 49° and 53°. The southernmost one, much used formerly by the buffalo-hunting Indians, leads over into the Kootenay valley. The next are Crow's Nest and Vermilion passes, then the one in which the Kananáskas takes its rise; after that the Kicking Horse, or railway pass, which we have reached by the ascent of the Bow river, and so on, until, under latitude 53°, we come to the Yellowhead or Athabasca pass. Many of the principal peaks in this range were long ago named by the botanist Douglas, or else by Dr. Hector, after prominent Englishmen of science,—Balfour, Forbes, Hooker, and others.

But while I make these digressive comments, you must remember that we are winding and climbing up a narrow stream-gorge, which will presently bring us into the very presence of the monarchs of the range. It is not a fearful journey. The railway attempts few acrobatic feats. Once indeed, it leaps the cataracts pouring through a short cañon, but then the extraordinary beauty of the emerald and white water tossed from side to side of the deep and gloomy chasm, the circle of snowy heights above, the broad overlook of forested foothills down the pass, so enchant the eye as to make the most nervous one forget his timidity. What room is there for any feeling save awe and wondering admiration at such pictures as the eye receives here, when we attain to higher and higher standpoints, and rank beyond rank of purple and crimson peaks, cloaked in snow and studded with ice, rise into our ken across a broad, rolling intervene of forest and crag!

Behold these two in which the range culminates—The Cathedral and Mt. Stephen! The former is poised upon a vast hilltop, as it were, of fallen débris, which has buried the base of the crags under long brown slopes; but far above these slopes—far above the last misshapen spruce—buttressed by cliffs, beneath which the clouds form for their long flight plainsward, stands the mighty summit whose partial ruin has left it gloriously picturesque in fallen wall, spire, pinnacle, and crumbling battlement. Gazing at this stupendous example of nature's stonework, Gothic in every feature, one doubts whether it is true that a tree gave the suggestion of that form of architecture; and conceives of it as growing out of an attempt by mountaineers to imitate the noble fea-

tures into which frost, lightning, and running water carve the rocks that point to heaven.

We move slowly past the splendid façade of The Cathedral, surprised, at each advancing step, by some new arch, toppling tower, or shining pediment of snow. Next opens to view an amphitheatre of snow, almost filling a half-circle of peaks in the rear. One horn of this crescent is The Cathedral. The other is Mt. Stephen, mounted upon a Titanic pedestal, whose pier-like masonry rises three thousand feet almost sheer above our heads.

Mt. Stephen is as noble as the central spire of the British Rockies ought to be ! It commands the clustered heights about it, and can be seen from far and near. So precipitous is the evenly stratified front, suggesting a pyramid cloven in twain, that it shows a naked face of black crag clear to its apex, marked only by the lines of snow lodged precariously upon its strata-ledges.

But sweeping backward from this frightful precipice-brink, close under the sky, are wide fields of unblemished snow, the abode of eternal silence and solitude. Now and then a venturesome wild goat may cross a spur to nibble the sweeter grass in some sheltered nook beyond ; or a ptarmigan may whirl in rapid flight along its skirt ; or the golden eagle, resting upon his pinions while the globe revolves beneath him, may scan its glistening wastes ; but otherwise the imagination has free scope upon those snowfields to draw pictures fearless of contradiction, for no man has ever surveyed their extent or probed their depth.

In the midst of those vast snows behind Mt. Stephen, one of the greatest of the glaciers rests—one which descends from unknown beginnings to the verge of a cliff

said to be two thousand feet high. It has never been my good fortune to see it well. Where there is so much snow, evaporation under the summer sun is incessant; and as this evaporation is almost immediately condensed by the chilled air, rolling, wind-tossed, and very beautiful clouds often linger about the snow-banks, above which black peaks emerge at intervals into the sparkling ether as the royals of a man-of-war overtop the lower canvas. In midsummer, too, the sunshine eats the surface of the glaciers, making them whitish and rounded. But in the cool autumn, when little moisture arises, and the concealing snows have not yet fallen, there is visible, where this glacier breaks at the brink of the cliff, a solid front of blue ice, upon which the sunlight plays in prismatic hues marvellous to behold.

Down from these reservoirs comes tumbling a torrent, —flashing through the funereal spruces and ringing upon the rocks. It seems not only to be fed by snow, but filled with its crystals—it is too white for a gliding fluid! Thus romantically springs into existence the Kicking Horse, which gives its name to the pass, and which we shall follow down to the great Columbia.

The track lies well up upon the shoulder of Mt. Stephen, whose crags topple over us on the left. On the right falls steeply away the forest-grown declivities of the gorge, separating us from bristling heights northward. Down in the bottom of this dark, rough ravine, beset with cañon-walls, crossed by innumerable ledges, hindered everywhere among fallen blocks and driftwood, the Kicking Horse rushes headlong with the speed of continuous leaping. There is no pause for it anywhere—no smallest space of quiet water—no color of blue or

green or gray, like another stream. All is snowy, sudsy foam, for every atom of it is filled with air; and the long streamers of snow trailing from the loftiest peaks are not so white as this flashing falchion of foam, cleaving its way through the black rocks and sombre woods.

For fifty miles we followed the stream to its exit, from the westernmost foothills of the range. The scenery is the same as before—and it is different. You look off to the right and left upon range after range and peak overtopping peak in blue and iron-gray and white. You think there can be nothing finer—nothing more stately; that rock and ice and snow, forest and torrent, cannot find grander expression. Then suddenly you emerge upon some bridge spanning a dizzy chasm, or wheel cautiously around a wooded headland (creeping always towards the foot of the great range), when, behold! some more noble combination—some loftier aspect—some new and sublimer phase of Alpine scenery. And, at last, you emerge upon the forested flood-plain of the Upper Columbia.

Presuming again upon the remoteness of this region, some explanation of the local geography may not be out of place.

Broken and group-like in Montana, the Rocky mountains north of the Boundary are arranged in three parallel serrations. The easternmost of these, which we have just crossed, is the continuation of the great cordillera, bordering the plains, and stretching from the sources of the Missouri to those of the Yukon. It is called The Rockies, proper, and its eastern face presents a bold and unencumbered front, but its western flank breaks into a jumble of spurs and annexed ranges, out of which the Kootenay river flows southward.

Close to the sources of the Kootenay lie the reservoirs of the mighty Columbia, which find their outlet northward in a powerful stream that pours through a series of gorges along the western base of the Rockies until it has passed the 52d parallel, nearly two hundred miles north-west of its starting-point. Then the mountains upon its left break down, and the Columbia, turning sharply round their head, moves straight southward to Oregon. Stretching north and south for two hundred miles within this great elbow of the Upper Columbia stand the magnificent Selkirks—

“———where they purely lift
Snows that have never wasted, in a sky
Which hath no stain.”

The course of the Columbia after it has turned southward around the head of the Selkirks is beset with lofty walls on both sides, as before, since west of the river rises a third gigantic upheaval designated the Gold range. The engineer of any transcontinental railway across southern Canada found opposed to him, therefore, before he could enter British Columbia, the three enormous mountain ranges I have mentioned—the Rockies, the Selkirks, and the Gold range; and two crossings of the broad and swift Columbia river. To have overcome these obstacles in the marvellously short time allowed, is one of the most notable feats in the history of railway construction.

The original route of the Canadian Pacific was intended to pass up the Saskatchewan, traverse the Rockies through Yellowhead pass, far to the northward, and follow westward through British Columbia by the old trappers' trail down Thompson river, cut out by McKenzie and the Hudson's Bay Company's people a century or more ago.

But at the last moment judgment was given in favor of the route we have followed through Kicking Horse pass, and thence across the Selkirks by the way of the Beaver and Illecillewet rivers. The railway had been built to the summit of the Selkirks at the time of my visit—although only two years before that no human foot, savage or civilized, had ever penetrated their fastnesses ; and it was rapidly approaching from the west. Two months later (November, 1885) the junction was effected, as you are aware, making these glorious mountains accessible to the public by a through route from Quebec to Victoria, or, more largely speaking, from London to Yokohama. But a large part of my explorations were made afoot or on horseback, in advance of this completion.

The first sight of the Selkirks from the eastern bank of the Columbia is alluring enough. The afternoon sun is dropping slowly toward it, and the mists of the broad valley rise into light clouds that fleecily veil the rugged outlines. In the golden glow which permeates the atmosphere these kings lay aside the sceptre of power and extend the hand of grace. Their snows sparkle rosily. We catch gleams of blue ice, like the flashing of jewels in a crown, the massive forms are enlarged and glorified with a marvellous transparency of color, and the rich, dark olive of the forest falling away at their feet forms a royal robe of velvet, whereon the warmer lines of close shrubbery sprouting upon the tracks of old snowslides serve as an exquisite trimming. The beauty of such mountains, beyond such a foreground, transfigured in the suffused color that saturates the vesper light, is not to be measured in words, or transferred to canvas, or even well appreciated by the senses, until it has

lain awhile in the receptive memory and been absorbed by the heart.

The gorge of the Beaver river, through which the railway climbs the eastern flank of the Selkirks, is especially noteworthy for its waterfalls, and for its bridge—the highest wooden bridge in the world,—which carries the track across Stony creek, two hundred and ninety-five feet above the water! It is not until the summit of the range is nearly gained, nevertheless, that the full meaning of the pass is revealed.

With sturdy force the locomotive toils up the sloping track, dragging the cars sullenly in and out of many curves. The V-shaped channel of a slender creek is far down at the left; verdure-hidden steeps overhang on the right. Suddenly we find our pathway hemmed in by enormous walls of rock. That on the left is Mount Carroll, whose mighty promontory rises straight up so vertical and tall, and from a base so near us, that it cuts away half the sky and seems to reach to the very zenith. How high is it really? I do not know—five or six thousand feet to the snow plumes on its icy casque; but exact figures do not concern us. Its Titanic front swings aloft in a noble curve that at the top seems to sway and tremble, and we feel rather than coldly measure, the grandeur of form, richness of color, and dignity of pose it expresses.

Next, attention is diverted by the roar of a cataract, which comes down, heavy and steamlike, from an invisible reservoir. Glacier creek is its name, and a few minutes later we can trace its upper course—a series of shining cataracts, leaping from ledge to ledge down through the trees for two or three thousand feet. Then we get away from the woods and attain the summit—a green

pit within that circle of peaks that hid so jealously the entrance to their citadel, 5,000 feet above the sea; and here, in the rear of the citadel-wall, as it were, one can understand far better than from the outside, the massiveness and power which the Selkirks express, by their breadth and solidity and burden-bearing strength.

To the eastward, for example, is what is called The Amphitheatre. It is a semicircle of splintered battlements—a combing curved along the crest of the range, braced by stanchions of glittering bronze and divided into upright triangles by slanting chasms, white with treasures of unmelted snow. Enclosed in the circle of this parapet, rests a plain of ice, curving downward, cornucopia-like, from an unseen head. This vast and beautiful glacier has an area of several miles, and in August was gray with decay, fallen rocks, and the powdering of recent storms. Streaks, patches, and marblings of vivid blue (in some lights green) could always be detected, however, where the solid ice was exposed in some crevasse or on a worn surface; and the whole sight was irresistibly attractive to the eye.

I could not contrive the time to climb to this glacier, which is about 3,000 feet above the pass. Prof. John Macoun, of Ottawa, whom I met here in search of alpine plants, had done so, and gave me an account of it. He says that in its upper part it seems to grind against the very bases of the cliffs and to rest upon a floor of solid rock, and that a border of undermined fragments, which have fallen from the imminent crags, strews its edges and is carried along in its progress. Toward its foot, however, the ice is narrower than the amphitheatre in which it rests, and between the ice and the wall lie old lateral

moraines, thinly overgrown with flowers. The glacier's foot was found to be some distance back from where it once had been, and its former terminal moraine was not well marked. The ice was several hundred feet thick along its front, and gashed by deep furrows where streams of water poured over, while Glacier creek, whose snowy cascades had excited our admiration, issued from underneath the *mer-de-glace* out of a huge vault of clear blue ice. The foot of this glacier is, approximately, 7,350 feet above tide water; yet it is overlooked by Carroll's and several other peaks.

A little to the westward of The Amphitheatre is another much smaller glacier, which Macoun also visited, and found to have retreated some one hundred and fifty feet from its former limit. It is an easy matter to climb from the railway up to this latter ice-field; but to pass around the cliffs some two miles to the greater one is a tiresome and somewhat perilous undertaking.

I remarked to Professor Macoun, what I have already suggested in this lecture, that the process of destruction in these mountains had never gone on rapidly, nor proceeded very far, in my opinion, and that now it had practically ceased, to which he replied that his much broader observation confirmed this view, and added that, not only the highest slopes of smooth hillside, but the tali at the base of the cliffs, were more or less covered with low plants, and bore only a trifling amount of freshly fallen material. This is in very striking contrast to the incessant disintegration and levelling going on in some of the ranges of Colorado, which I have described in my "*Crest of the Continent*" (p. 150 *et seq.*); yet I know no reason why the Selkirks should enjoy their immunity, unless it

may be that the climate of the north is less subject to rapid fluctuations and extremes of heat and cold than that of the south, for I doubt whether the rocks here are much tougher.

A whole essay would but hint at the magnificence of The Amphitheatre; yet it constitutes only a small segment of the adamantine girdle with which this summit pass is bound. *I* looked upon the burnished triangles that mark its shivered crest, sitting on the logs of a forest cut only the day before. *You* may enjoy it, when you go there next summer, rocking in easy chairs and surrounded by the luxuries of a city-like hotel, confident of a bed and sure of your dinner, without which scenery is a vanity and the glories of color and form are as naught.

The railway begins its descent upon the western side around a series of loops, some nine miles in length, supported upon trestles of extraordinary length and height. The head of one of these loops passes close to the front of another glacier, which is the largest of all those to be seen in the Selkirks, and should be honored with the name of Louis Agassiz. This glacier is most easily reached of all, and, hence, is most likely, in the future, to be visited and talked about by tourists, who can find upon it all the excitement of real Alpine travel. It is only about a thousand feet above the level of the rails, and after a trail has been cut through the exceedingly thick woods in the ravine there will be little or no difficulty in reaching it. I see no reason why, in a few years, the exploration of these ice-sheets, with the ascent of the terrific heights that environ them, should not be as much objects of adventurous ambition as to perform a similar achievement in the Swiss or Tyrolese Alps. I predict

that this will be the case; and he who goes earliest will have the highest reward in novelty of experience.

When the sun is just past noon there creeps out upon this glacier a triangular shadow miles in width. It is the shadow of Syndicate Peak—a superb prism shooting its slender apex far above all its royal mates, and cleaving clouds that have swept unhindered over their heads. The poise and self-sustaining splendor of this snow-striped peak—a landmark for soaring eagles from the Saskatchewan to the Fraser—the culmination and pride of the Selkirks—is worthy the pen of some master of words and idolater of mountains like John Ruskin. In all pictures of the Selkirk mountains, in their western aspect, it stands pre-eminent—a sublime centre-piece!

From the summit of the Selkirks to the second crossing of the Columbia, on their western side, the distance is seventy-five miles. All of this space lies in the rugged valley of the Illecillewet, which spelling, I am told, is a corruption of En-cil-wháit-k—words in a dialect of the Kalispelm language, which might be translated “swift-current.”

The Illecillewet is a turbulent mountain stream, of no great size, occupying a valley, sometimes of considerable width, everywhere filled with that remarkable forest for which British Columbia is famous. The great size of the trees attracts attention when the eastern ascent of the Selkirks begins; but it is only after the summit has been passed that their full development is encountered. The principal species are the Douglas spruce or “Oregon pine” (*Pseudotsuga*), the white “cedar” (*Thuja*), a hemlock (*Tsuga Mertensiana*?), and Engleman’s spruce (*Picea*). On the bottoms grow scattered poplars, paper

birches, dwarf maples, together with thickets of small willows, and other under-shrubs.

The feature that first impressed me among these trees was not their tallness so much as their multitude, yet I was surrounded by mast-like trunks reaching two hundred and fifty or even three hundred feet straight into the air—as high as the towers of the Brooklyn bridge; and it was, in fact, the bulk of their mighty boles, rather than the number, which made the forest seem so crowded.

The ground underneath such a close thick canopy of foliage is forever shaded and damp, both with ceaseless dews and with the tricklings of the surrounding uplands. Hence there grows an extravagance of mosses, ferns, fungi, moulds, and all plants that love moisture and are not afraid of chills. The soil in the woods is hillocky with moss, burying rocks and earth, as well as mouldering logs and the bases of the trees, under a thick, oozy rug. There are hosts of soft creeping plants, too, and pretty flowers and berries, many of them strange to eastern eyes.

Two details of the botany are particularly noticeable—the horrid “Devil’s club” and the fungi, huge polypori, attached at all heights to the trees, serving as substantial brackets for charming hanging gardens of flowers and trailing vines. The far-famed Devil’s club is a tall plant, bearing large, palmate leaves at the summit of two or three scraggy branches and presenting a very pleasing appearance at a distance. Close contact teaches you that these ugly stems and leaves are studded with horrible spines, sharp as needles, strong as rose-thorns, and twice as numerous as either. Dense jungles of this malicious weed (*Eunax horrida*, I believe) grow as high as one’s head in many places, and make travel in the

woods, where the foot slips at every step over some obstruction or into some pit concealed by the Kidderminster of wet moss, not only a toilsome but a most painful task. Moreover, the prickles are sharp and acrid not only, but barbed as well, so that they work their way into the flesh and make bad sores unless quickly extracted. Altogether the Selkirks possess one of the most picturesque forests to look at, and one of the very worst to travel through on the face of the earth.

In going down, the finest scenery is left behind, and the observer must seek the rear of the train in order to enjoy it. The luminous peaks at the summit, clustered about old Syndicate, group and regroup themselves above the green forest-slopes, as the train turns this way and that on its winding track down the pass, so that you never tire of the kaleidoscopic pictures. Then presently we get down to where the more distant peaks north and south come into view; and here and there we cross a district of snow-slides, or perhaps meet with banks of hardened snow and rubbish, fifty or one hundred feet deep, which have lasted all summer in the bottom of the gorge, arching the noisy torrent, to show where the burden of a mountain-side had been cast down. Wide spaces above these banks appear free of trees, proving that season after season the avalanches sweep them clean; and this feature offered one of the most difficult problems with which the railway builders had to contend.

The western foot of the Selkirks rests upon a wooded river-plain or level valley, several miles in width at this point, through which the Columbia now pursues a devious channel some fifty feet below the general level.

The second crossing of the river occurs at a point

somewhat southeast of Donald, the first crossing, and a town named Farwell has sprung up there, where all the liveliness and license of the extreme frontier were exemplified at the time of my visit. The river here sweeps in a fine bend away toward the base of the Gold range, several of whose grandest peaks, crowned with glaciers, are visible. The current is very swift (some eight miles an hour) and beset by eddies and rapids, yet a steamboat makes regular trips from Farwell down into Idaho—where communication is had with the Northern Pacific railway, at Spokane Falls, by means of wagons.

Immediately opposite Farwell, and only three miles distant, is the entrance to the Eagle pass through the Gold range—the third and westernmost rank of the Rocky-mountain system in this region. Though the range itself is lofty, rugged, and capped with ice and snow in splendid array, this newly found pass is low and easy, and said to be very pretty; but I did not have the time to go up into it, and so on over to the end of the other railway, which would have carried me down through the Fraser cañons to the Pacific; and with a few words about mining prospects I must bring these notes of travel to a close.

Twenty-five years ago, when the placers of California and Montana had begun to fail, there was a rush into British Columbia to work the gold fields discovered away up between parallels 52° and 53°, known as the Fraser and Cariboo diggings. The streams along which these placers lay come from the western slope of these same Gold mountains, and the Cariboo district, northward, still has productive mines, supporting a large population of cattlemen and farmers. Prospectors pushing across the

range soon reported rich placers on its eastern slope at the Big Bend of the Columbia. The usual rush thither followed. Log towns were built and mines opened ; but it was found impossible to get provisions enough into that remote region to sustain life, and after untold sufferings, and many and many a death, the last of the adventurers abandoned the place, leaving their cabins to rot down over the machinery, furniture, billiard-tables, and other signs of temporary occupancy which remain hidden in the jungles there to this day.

That was twenty years and more ago. As soon as the railway made the region newly accessible, prospecting for precious metals was resumed, and the outcome has been most gratifying. Many of the placers are about to be reworked, and tunnels are being driven upon veins of quartz rich in both silver and gold—amazingly rich in many instances. Moreover (not to speak of some scattered mining among the metamorphic slates and limestones of the Rockies and Selkirks), many new localities along both sides of this Gold range have been discovered, which promise to yield a profitable return.

The ores here closely resemble those of Idaho, Montana, and Utah. In truth, they ought to. A continuous line of mineral-bearing upheavals may be traced from the Stickeen region of Alaska through the Cariboo country, down the Gold range into the Kootenay district of British Columbia and the Fort Colville and Cœur d'Alène regions of Idaho (always trending easterly), to Montana, Eastern Idaho, the Wahsatch, and so on through Arizona to Mexico. Here, then, is the geological axis of the Rocky mountains, in this Gold range, the least prominent of the British Columbian mountains ; while the Sel-

kirks and the Rockies (so-called) are, *structurally* speaking, *foothills*, despite their superior majesty of height and splendor of pose. You will find not a particle of primitive rock in all their breadth—only palæozoic sedimentary rocks, more or less changed by the vicissitudes of heat through which they have passed, since first laid down at the bottom of the carboniferous seas.

Geologically speaking, therefore, the backbone of the continent is here entirely west of the Columbia river, and it is its easternmost foothills which separate the waters of the Atlantic slope from those of the Pacific, and so make the geographical divide. But what superb hills they are!

And now, having by a quiet, matter-of-fact statement, brought you gently down from the heights of rhapsody, in whose thin air I fear you have been kept too long, I regretfully bid you farewell, with many thanks for your company over the mountains.

NOTE.—More extended accounts of these mountains, derived from the trip herein sketched, appear over my signature in *The Field* (of London, England) for December 26, 1885, and January 2 and 16, 1886; and in *Science* (New York), vol. vi., November 27, and December 25, 1885, and vol. vii., March 12, 1886. The publications of the Geological Survey of Canada, and of the Canadian Pacific railway also contain many papers relating to that region and the contiguous plains on both sides.—E. I.